Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

An examination of the factored form of the derivative shows that $\gamma = 120°$ gives a minimum.

Incidentally,

$$t = 4\sqrt{\frac{p}{3g\sqrt{3}}}, \qquad s = \tfrac{4}{3}p.$$

Also solved by T. M. Blakslee, R. A. Johnson, H. L. Olson, Arthur Pelletier, S. W. Reaves, J. B. Reynolds, and Elijah Swift.

2794 [1919 458]. Proposed by B. J. BROWN, Kansas City, Mo.

Find the value of $x^{e^x} \div x^{x^x}$ when $x \doteq 0$ and when $x \doteq \infty$. I. C. S. 1902.

Solution by Paul Capron, U. S. Naval Academy.

A^{b^c} is taken to mean $A^{(b^c)}$.

(i) When $x \doteq 0$, it is well known that $e^x \doteq 1$, $x^x \doteq 1$;

$$x\,(\log x)^n \doteq \frac{(\log x)^n}{1/x} \doteq -n\frac{(\log x)^{n-1}}{1/x} \doteq \cdots \doteq \pm n!\,x \doteq 0. \qquad y = x^{e^x} \div x^{x^x} = x^{e^x - x^x}.$$

$$\log y = (e^x - x^x)\log x = \frac{e^x - x^x}{1/\log x} \doteq \frac{0}{0} \doteq \frac{e^x - x^x(1 + \log x)}{-\dfrac{1}{x(\log x)^2}}$$

$$\doteq -xe^x(\log x)^2 + x^x(x(\log x)^2 + x(\log x)^3 \doteq 1.0 + 1(0 + 0) = 0.$$

Hence, as $x \doteq 0$, $y \doteq 1$.

(ii) When $x \doteq \infty$,

$$x^x \div e^x = \left(\frac{x}{e}\right)^x \doteq \infty;$$

hence,

$$e^x - x^x = e^x\left(1 - \left(\frac{x}{e}\right)^x\right) \doteq -\infty;$$

i.e., with the notation of (i), $\log y = (e^x - x^x)\log x \doteq (-\infty)(+\infty) \doteq -\infty$, or $y \doteq 0$.

2795 [1919, 458]. Proposed by C. N. SCHMALL, New York City.

A square is described touching the ellipse, $x^2/a^2 + y^2/b^2 = 1$, at the ends of its minor axis; a second ellipse is drawn circumscribing the square and tangent to the given ellipse at the ends of the major axis. The new ellipse is treated as the first and the process is continued until there are n new ellipses. Show that the last ellipse is a circle if the eccentricity of the original ellipse is $\sqrt{n/(n+1)}$.

Solution by Gertrude I. McCain, Oxford, Ohio.

If x', y' be the coördinates of a corner of the first square, then each equals b; and, lying on the second ellipse,

$$\frac{x'^2}{a^2} + \frac{y'^2}{b_1^2} = 1,$$

where b_1 is the minor axis of the first circumscribed ellipse. Substituting b for x' and y' and solving for b_1^2,

$$b_1^2 = \frac{a^2b^2}{a^2 - b^2}.$$

Similarly,

$$b_2^2 = \frac{a^2b_1^2}{a^2 - b_1^2} = \frac{a^2b^2}{a^2 - 2b^2},$$

and

$$b_n^2 = \frac{a^2b^2}{a^2 - nb^2}.$$

If $\frac{a^2 - b^2}{a^2} = \frac{n}{n+1}$, then $n = \frac{a^2 - b^2}{b^2}$. Substituting this value of n, $b_n^2 = a^2$. Hence, the last ellipse is a circle.

Also solved by NORMAN ANNING, GRACE M. BAREIS, PAUL CAPRON, H. O. HANSON, OLIVE C. HAZLETT, E. J. OGLESBY, H. L. OLSON, ARTHUR PELLETIER, J. L. RILEY, C. P. SOUSLEY, ELIJAH SWIFT, and H. S. UHLER.

NOTES AND NEWS.

IT IS HOPED THAT READERS OF THE MONTHLY WILL COOPERATE IN CONTRIBUTING TO THE GENERAL INTEREST OF THIS DEPARTMENT BY SENDING ITEMS TO THE EDITOR-IN-CHIEF.

Mr. L. M. GRAVES of Chicago, has been appointed instructor in mathematics at Washington University.

Miss LOUISA M. WEBSTER, associate professor of mathematics at Hunter College, has been appointed principal of the Hunter College High School.

Mr. H. L. OLSON, of the University of Wisconsin, has been appointed instructor in mathematics at the University of Michigan.

At the University of Nebraska, Dr. T. A. PIERCE has been promoted to an assistant-professorship of mathematics; Mr. W. M. BOND and Mr. C. R. SHERER have been appointed instructors, and Miss C. RUMMONS assistant instructor.

Mr. OSCAR SCHMIEDEL has been appointed professor of mathematics at Nebraska Wesleyan University.

H. S. MYERS, for four years professor of mathematics at Huron (S. D.) College, has taken a similar position at Southwestern College, Winfield, Kansas.

Professor SOLOMON LEFSCHETZ of the University of Kansas will be absent on leave during this academic year most of which he will spend in Europe.

Professor HARRIET GLAZIER of Western College for Women has been given an extended leave of absence for a second year and will spend the year at Southern Branch of the University of California, filling the vacancy caused by the absence for the year of Professor MYRTIE COLLIER.

At the University of Texas Miss ANNA MULLIGAN and Miss HELMA HOLMES have been appointed instructors, and Mr. CLAUDE BAILEY, tutor, in mathematics.

Mr. O. C. COLLINS, of Oxford University, England, has been appointed instructor in mathematics at the University of Nebraska.

Mr. C. E. HARRINGTON, M. E. (Cornell), has been appointed as an instructor in mathematics at the University of Buffalo.

Professor E. H. THOMAS of Tabor College has been appointed professor of physics at Southeast Missouri State Teachers College.

Mr. J. B. ROSENBACH, last year at the University of Illinois, has been appointed to an instructorship in mathematics at the Carnegie Institute of Technology. During the summer vacation Mr. Rosenbach was employed in the valuation department of the Atchison, Topeka and Santa Fe Railway.